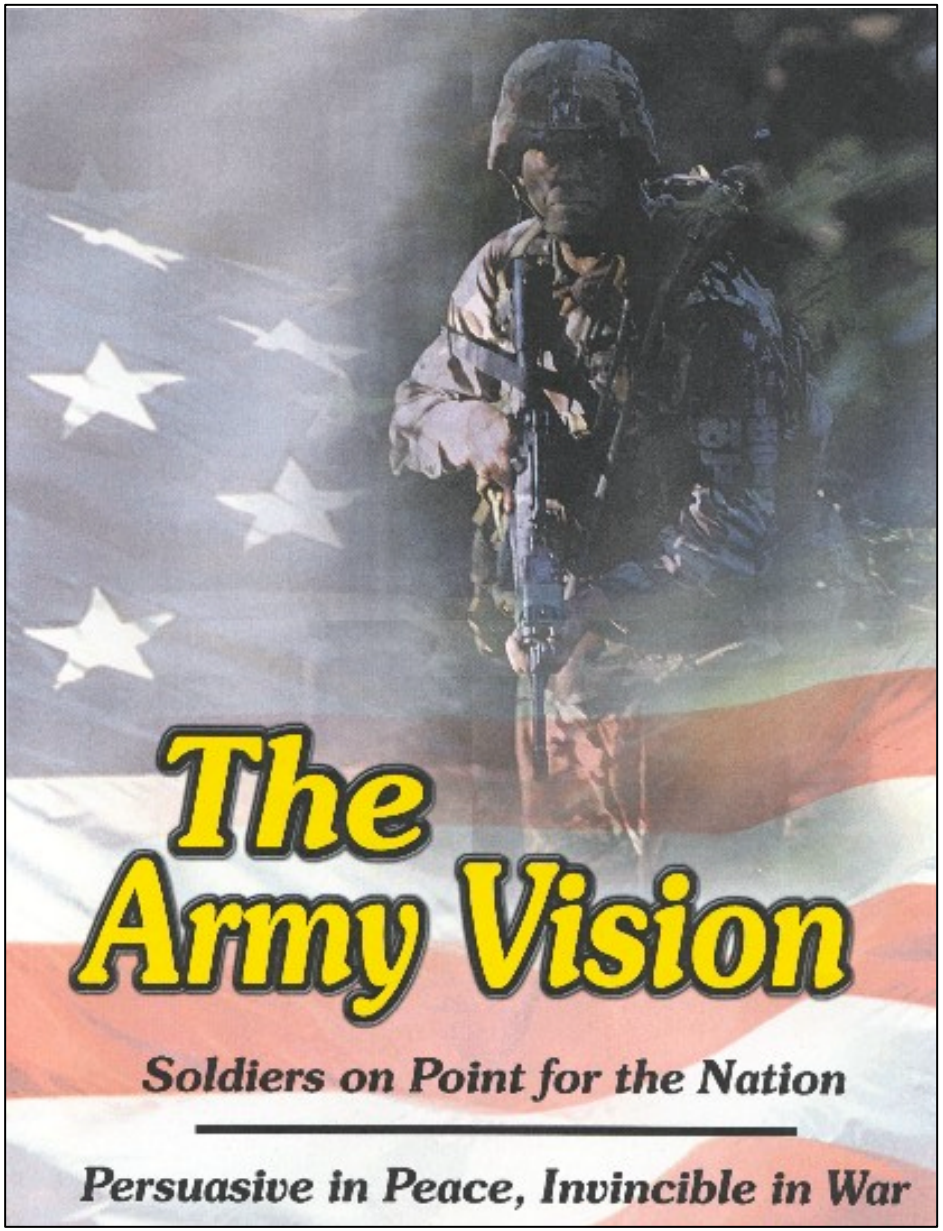
Army S&T Transformation Strategy

NDIA Conference

February 7, 2002

Dr. A. Michael Andrews
Deputy Assistant Secretary of the Army for Research and Technology / Chief Scientist



Outline

- *Why Change?*
- *Operational Transformation*
- *S&T Strategy*

Objective Force for Full Spectrum of Missions

Environmental Complexity

High
Urban

Open rolling terrain

Low

Stability and Support Operations — **Small Scale Contingencies** — **Major Theater War**

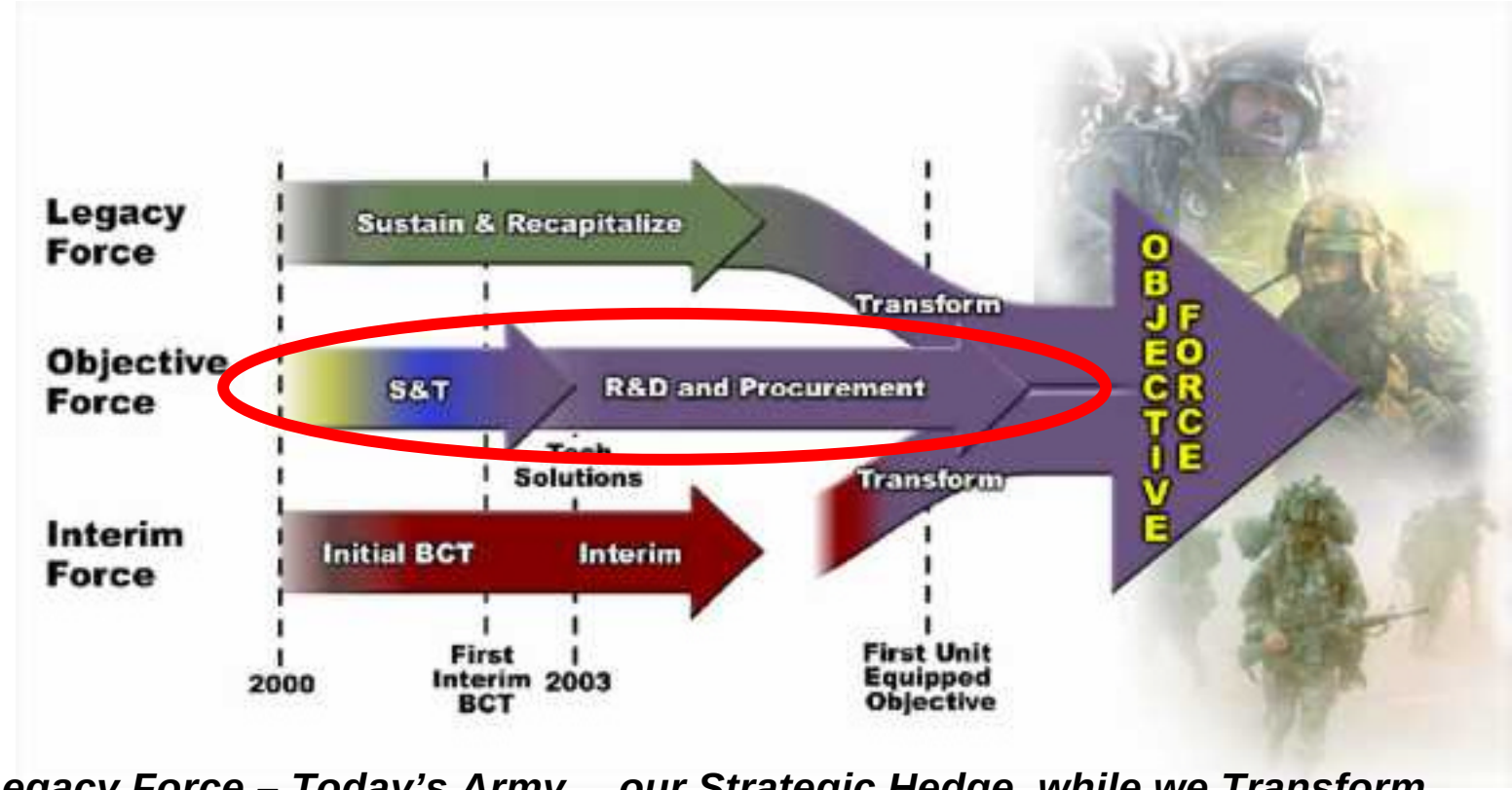
Spectrum of Conflict

Increased strategic responsiveness

- ✓ Brigade in 96 hrs; Division in 120 hrs; Five Divisions in 30 days
- ✓ Fight immediately upon arrival
- ✓ Simultaneous air and sea lift

Capabilities for an Uncertain Future

The Army Transformation



- *Legacy Force – Today's Army… our Strategic Hedge, while we Transform*
- *Interim Force – Our Bridge to the Future*
- *The Objective Force – The Army's Full Spectrum, Decisive Ground Combat Force*

. . . Responsive, Deployable, Agile, Versatile, Lethal, Survivable, Sustainable

Objective Force Needs

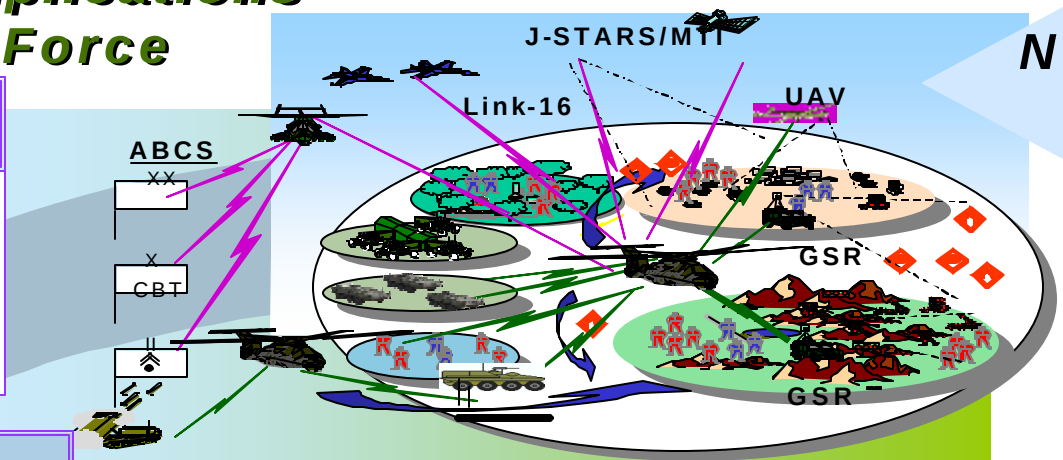
Objective Force TF

Operational Implications - The Objective Force

See First

Situational Awareness

- See the parts
- See the whole
- See the environment
- Force the enemy to see last



Network Centric

Understand First

Situational Understanding

- See the platform (understand)
- See the next step (anticipate)
- Force the enemy to understand last

Act First

Qualitative rapid decisions

- Develop situation out/in contact
- Platform – shoot, move, reengage
- Unit – determine options, decide, act, transition, synch
- Force the enemy to act last or wrong

Finish Decisively

- Destroy the enemy's ability to fight
- Eliminate enemy freedom of action
- Exploit success
- Follow through to enemy destruction

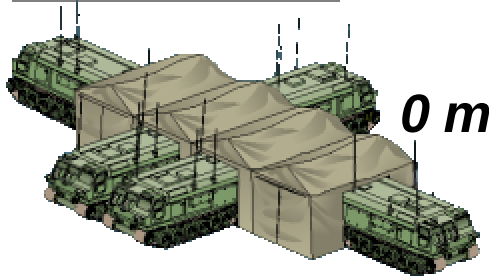
"The Objective Force…Our Legacy…Their Destiny"

A Revolution in Capabilities . . . Smaller, Lighter & Faster

Today

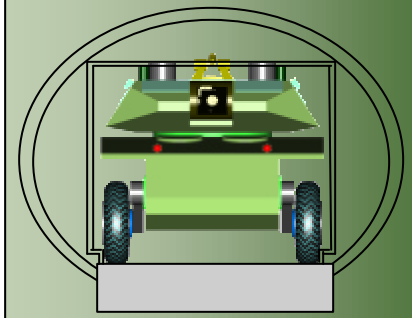
~100 lb. load

70+ tons



0 mph

Fit the C-130 "Crucible"



Objective Force

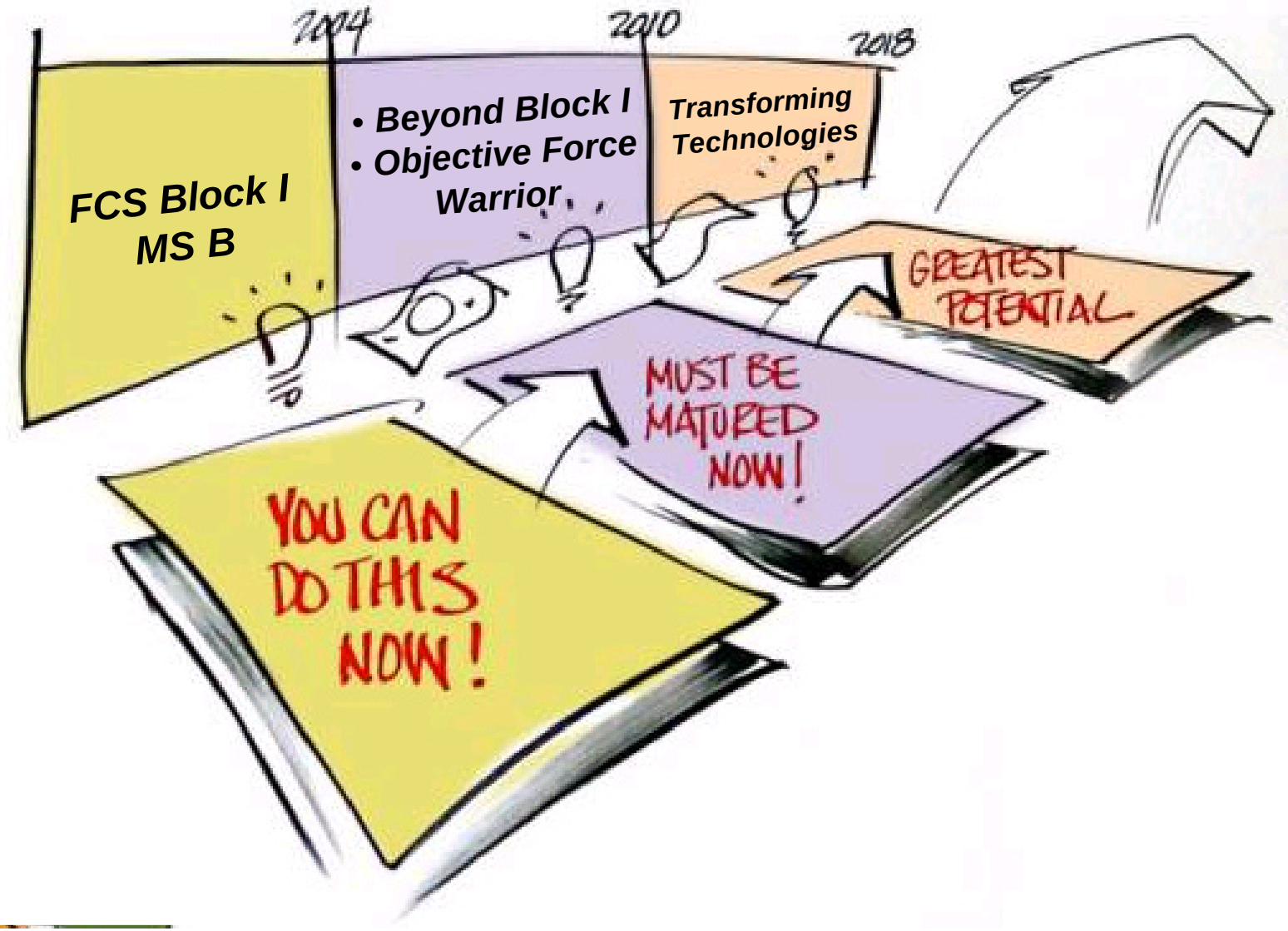
< 40 lb. effective load

< 20 tons

> 40 mph

Innovation -- Accelerating the Pace of Army Transformation

The Goal for S&T …… Transforming to the Objective Force



Objective Force Technology Areas

Future Combat Systems Technology

Basic Research

C4ISR

Medical

Future Warrior

Lethality

Rotorcraft

Logistics Reduction

Survivability

Classified Programs

Personnel Tech

Adv. Simulation

PB03 $1.6B

Force Transformation

Objective Force Capabilities

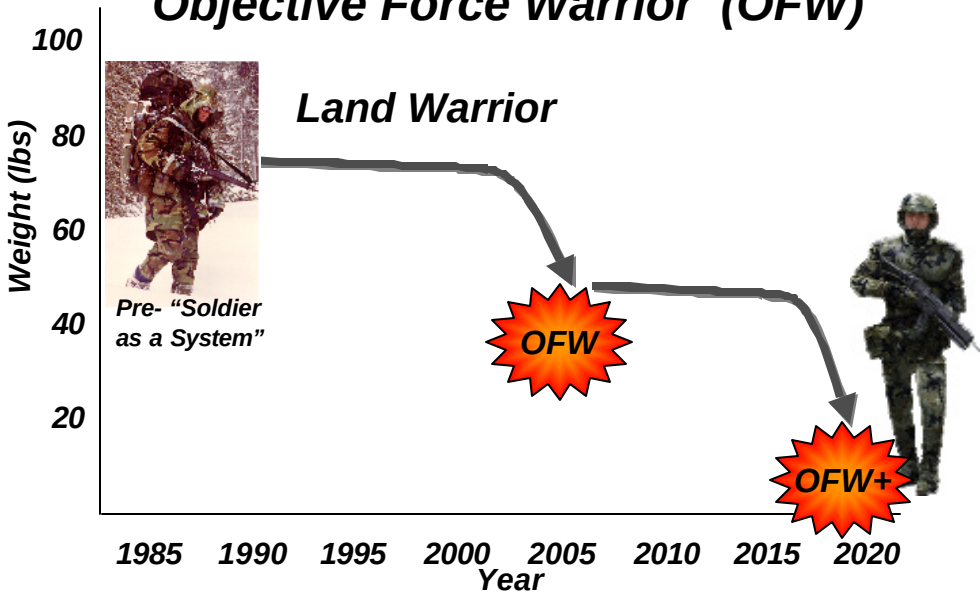
- RESPONSIVE
- DEPLOYABLE
- AGILE
- VERSATILE
- LETHAL
- SURVIVABLE
- SUSTAINABLE

Transformation through Innovation

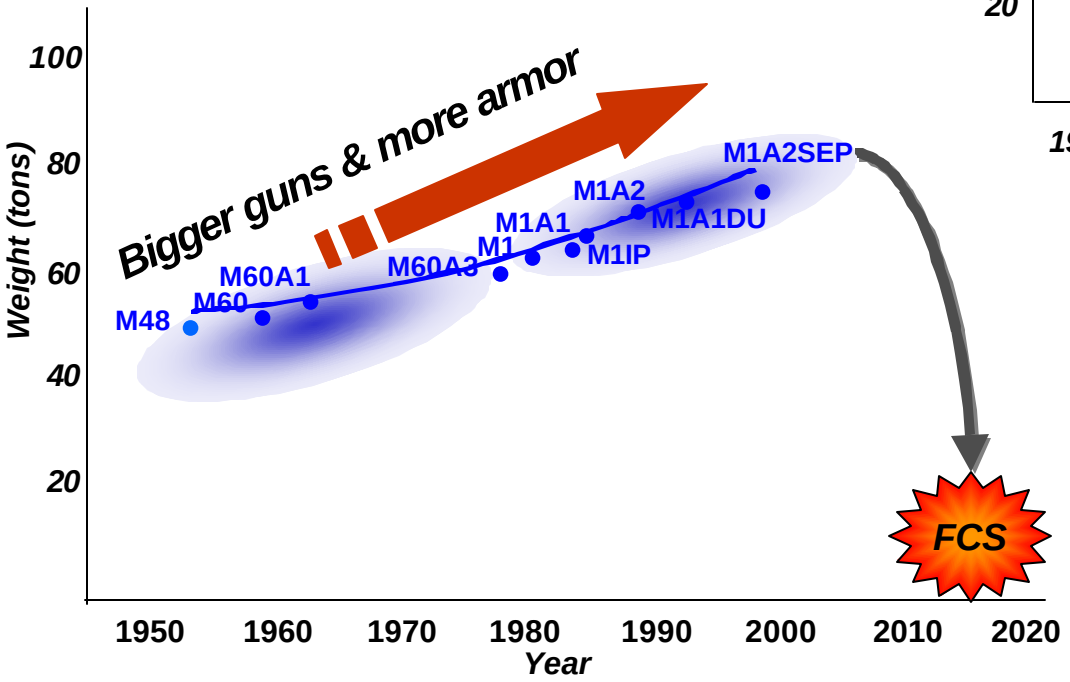
Objective Force Designs Need … System of Systems Approach

Transformation Demands …

Objective Force Warrior (OFW)



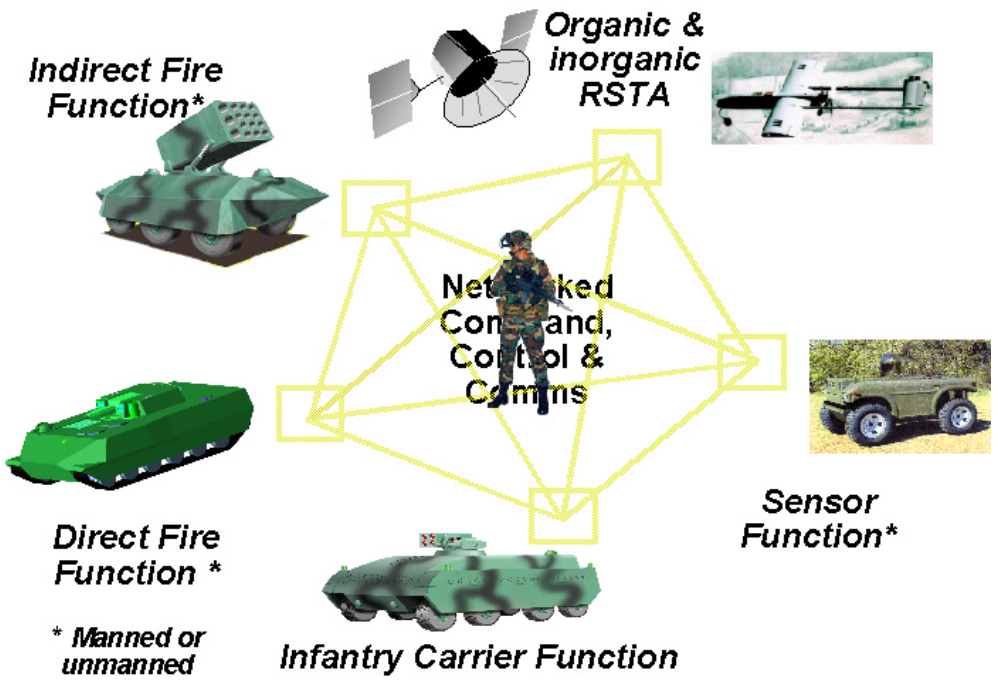
Future Combat Systems (FCS)



Paradigm Shifts in Approaches

Future Combat Systems

Notional Systems Construct



System of Systems Approach… not platform-centric

DARPA / Army Collaboration

- DARPA: high risk & innovative approaches*
- Army: accelerates high-payoff core technologies

** $964M Collaborative MOA (FY00-05)*

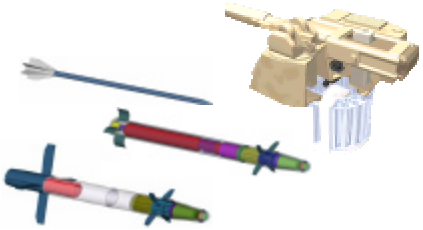
Overwhelming Organizational Combat Power

Future Combat Systems Technologies

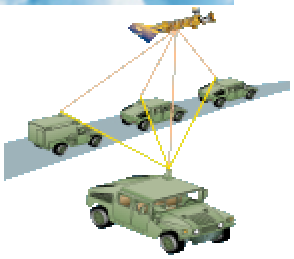
UAV RSTA / Comm Relay

Adv. Sensors

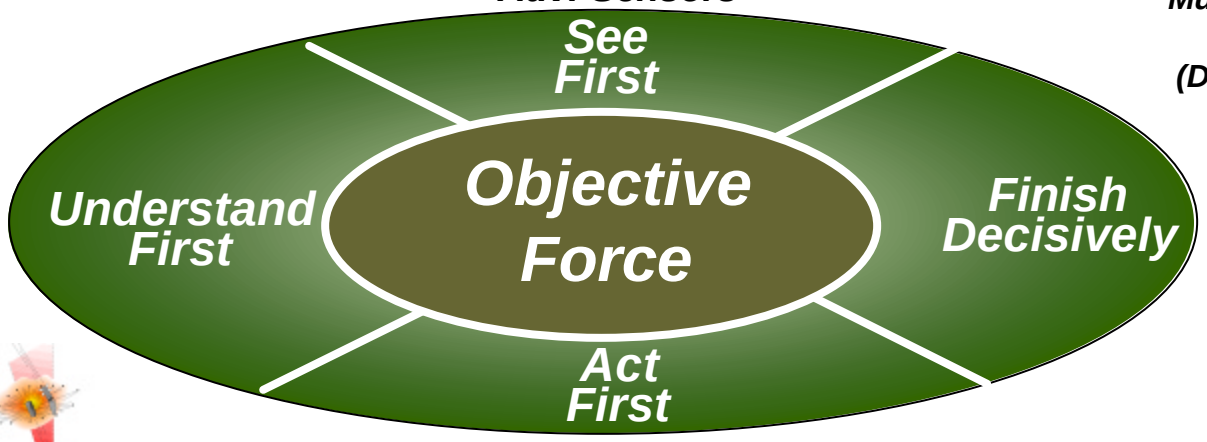
Follower UGV

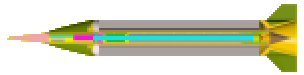


Multi-Role Armament & Ammo Suite (Direct & Indirect Fire)

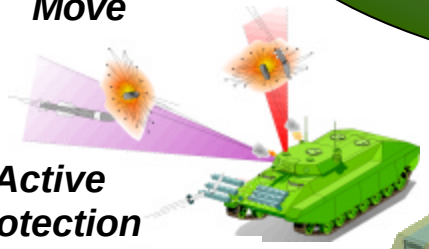


C3 On the Move

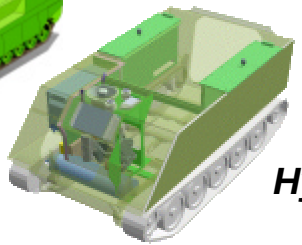




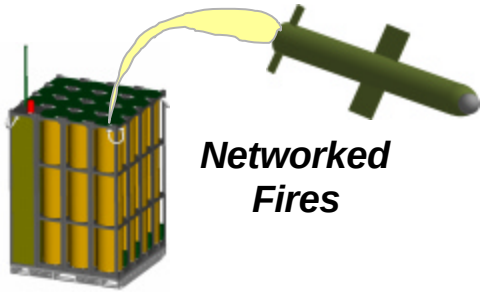
Compact Kinetic Energy Missile



Active Protection

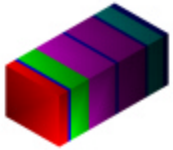


Hybrid Electric Propulsion



Networked Fires

OCSW

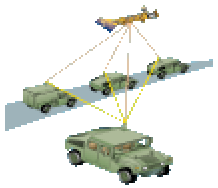


Integrated Armor

Technologies to Build FCS in this Decade

Technology Options for the Objective Force Warrior

Signature Management



Connectivity to Objective Force C4ISR

Water Purification & Generation

Exoskeleton

Advanced Sensors

See First

Understand First

Objective Force Warrior

Finish Decisively

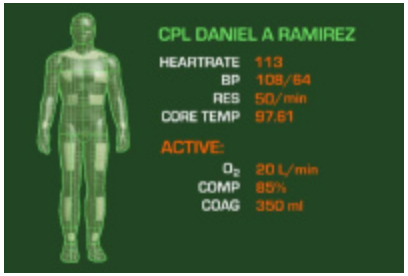
Act First

Advanced Armor

Agile Lethality Effects

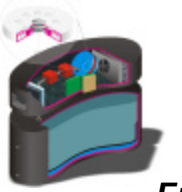
Robotic Mule

Armed UAV



Physiological monitor and Causality Combat Care

Micro UAV



Fuel Cells

Options to Achieve Revolutionary Capabilities

Winning the Race for Speed and Precision ….Transforming Technologies

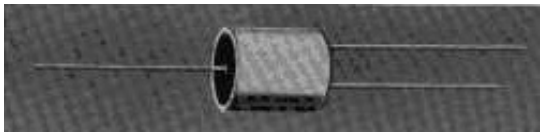
Decade of the 1950's

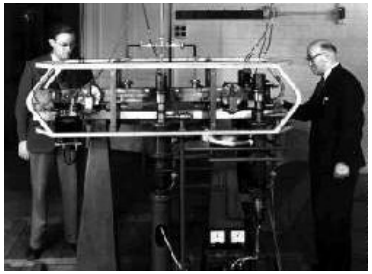
Lasers

Programmable Systems

ENIAC

Transistor



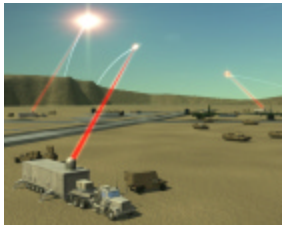


Atomic Clock

DNA

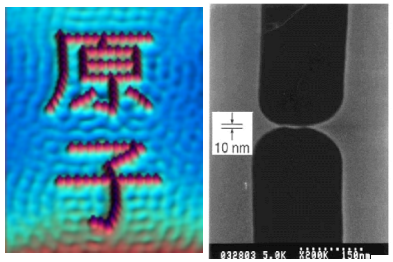
This Decade

Directed Energy

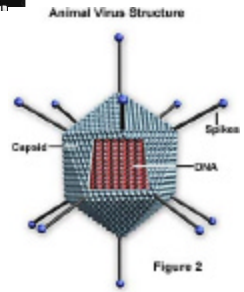


Robotics

Nanotechnology



Immersive Environments



Biotechnology

Institute for Soldier Nanotechnologies

University Affiliated Research Center

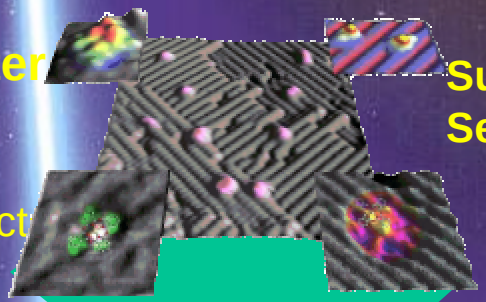
- Investment in Soldier Protection
- Industry partnership/participation
- Accelerate transition of Research Product

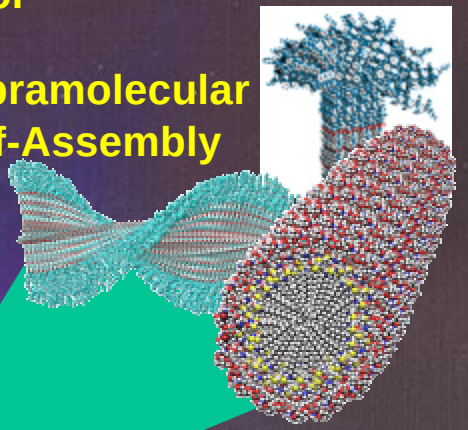
Goals

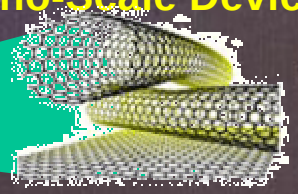
- Enhance Objective Force Warrior survivability
- Leverage breakthroughs in nanoscience & nanomanufacturing

Investment Areas

- Nanofibers for Lighter Materials
- Active/reactive Ballistic Protection (solve energy dissipation problem)
- Environmental Protection
- Micro-Climate Conditioning
- Signature Management
- Chem/Bio Detection and Protection
- Biomonitoring/Triage
- Exoskeleton Components

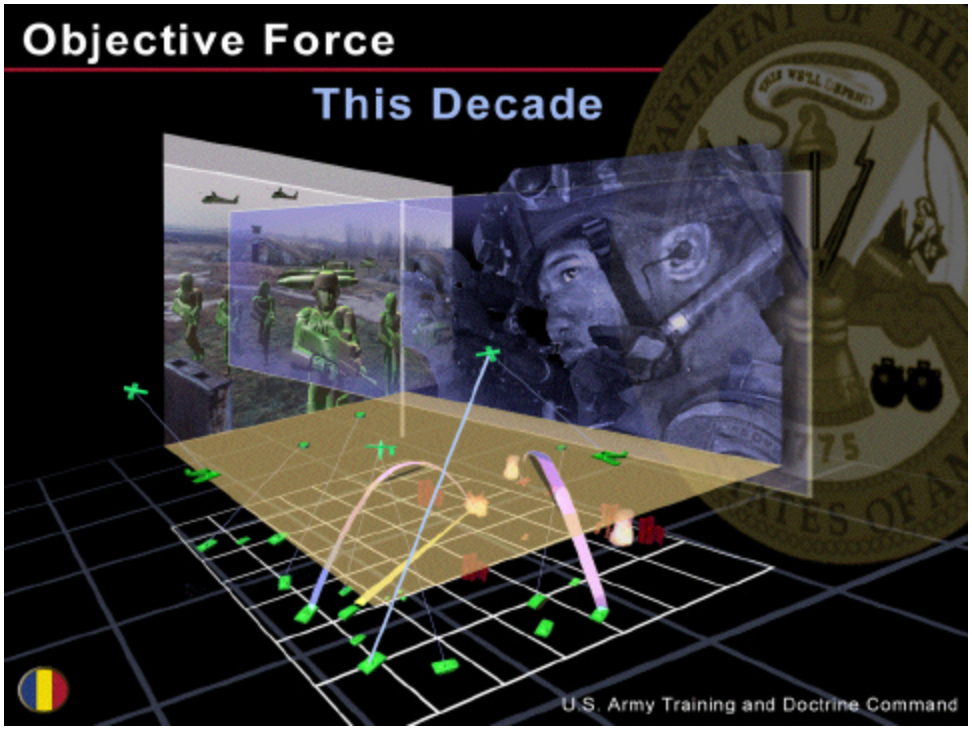






The Army…

On the Fast Track to Transformation



- *"The ultimate goal for the Transformation is the Objective Force."*

- *"…[the goal for] Science and Technology efforts is to begin fielding the Objective Force by the end of the current decade."*

- Joint Statement SEC Army & CSA

June 13, 2001 Senate Appropriations Sub-Committee